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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,694	03/22/2005	Takashi Yamada	Q86732	4647

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EXAMINER

GAWORECKI, MARK R

ART UNIT	PAPER NUMBER
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2884

DATE MAILED: 04/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/528,694	<b>Applicant(s)</b> YAMADA ET AL.	
	<b>Examiner</b> Mark R. Gaworecki	<b>Art Unit</b> 2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 10-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-12 is/are rejected.
- 7) ☒ Claim(s) 13-18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>8/24/05, 3/22/05</u>  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maekawa *et al.* (6,570,160) in view of Sekine *et al.* (6,844,570).

With respect to claim 10, the radiation detector (11) disclosed by Maekawa *et al.*, which detects a first and second type of radiation (column 3, lines 20-26), comprises a plurality of optical transducers (scintillators, 14 and 15) which convert the first radiation to a first light having a first wavelength, and convert the second radiation to a second light having a second wavelength (column 4, lines 29-39). The radiation detector further comprises a plurality of first and second photoelectric converters that correspond to each of the optical transducers and output a first and second electrical signal based on the intensity of the first and second light, respectively (photo-detectors, 17). Maekawa *et al.* fails to show an array of optical transducers separated by a shielding unit. The radiation detector disclosed by Sekine *et al.* comprises a collimator unit (14), fit between adjacent scintillators (11) for shielding purposes. It would have been obvious to one of ordinary skill in the art at the time the invention was made to arrange a plurality of the detection devices disclosed by Maekawa *et al.* into an

array in order to more accurately detect spatial distribution of radiation. It would also have been obvious to one of ordinary skill in the art at the time the invention was made to include the shielding member to avoid cross talk between adjacent scintillators.

With respect to claim 12, the radiation detector as described by Maekawa *et al.* includes scintillators (14 and 15) and photomultipliers (photo-detectors, 17) for detecting two distinct types of incident radiation, fails to show either of the two radiations to be X-rays or specify the photoelectric converter including a photodiode. The radiation detector described by Sekine *et al.* teaches the use of a scintillator array (59) constructed with photodiodes (55) for detecting X-ray radiation (Fig 19.). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute scintillators with associated photodiodes for detecting X-rays into the detector disclosed by Maekawa *et al.* in order to adapt the device for use in detecting a different type of radiation, depending on the application.

3. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maekawa *et al.* (6,570,160) and Sekine *et al.* (6,844,570) as applied to claims 10 and 12 above, and further in view of Takami *et al.* (4,090,081).

With respect to claim 11, the combination as described fails to teach gamma rays as either the first or second radiations. The combination further fails to teach a photoelectric converter including a photomultiplier for detecting gamma rays. The radiation detector of Takami *et al.* teaches the use of

scintillator (crystals 5 and 6) with associated photomultipliers ( $PM_{i-3}$  through  $PM_{i+1}$ ) for detecting gamma rays (column 1, lines 55-59). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute scintillators with associated photomultipliers for detecting gamma rays into the detector disclosed by Maekawa *et al.* and Sekine *et al.* in order to adapt the device for use in detecting a different type of radiation, depending on the application.

### ***Claim Objections***

4. Claims 13-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
5. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claim 13, the radiation detector described by Maekawa *et al.* includes photoelectric converters (17), which are located downstream of a direction of the first radiation and the second radiation with respect to the optical transducer (14 and 15), but fails to show the second photoelectric converters arranged on a side of the direction of the first and second radiations with respect with the optical transducer.

With respect to claim 14, the radiation detector described by Maekawa *et al.* includes optical transducers (14 and 15) which include scintillators, but fails to show the scintillators arranged in one dimension. Maekawa *et al.* further fails to

show a set of second photoelectric converters which include a photodiode array. The radiation detector of Sekine *et al.* shows photoelectric converters that include a photodiode array (2) in which the photodiodes are arranged in one dimension on the side of a scintillator array (Fig. 5), in which each photodiode corresponds to a scintillator, but fails to show the ability to detect a second type of radiation.

With respect to claims 15 and 16, the radiation detector shown by Sekine *et al.* includes a photodiode array (2), which includes a wiring pattern (7) along the photodiode array, but fails to show the detection of a second type of radiation.

With respect to claim 17, the radiation detector disclosed by Sekine *et al.* is shown to be arranged in such a way that a plurality of scintillator arrays (11) and photodiode arrays (2) are arranged in parallel to form a two-dimensional array (Fig.6), but this device fails to teach limitations disclosed in claims upon which claim 17 depends.

With respect to claim 18, the radiation detector shown by Maekawa *et al.* shows a set of photoelectric converters (17) arranged downstream of an incident direction (Fig. 1) of the first and second radiations with respect to the optical transducer (14 and 15), but fails to show a second photoelectric converter which is transparent to the first and second radiations and arranged upstream of the incident direction of the first and second radiations with respect to the optical transducer.

Thus, these limitations are not taught, disclosed, or rendered obvious by the prior art of record.

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to radiation detectors:

U.S. Pat. No. 5,216,252 to Boone *et al.*

U.S. Pat. No. 5,393,981 to Szabo *et al.*

U.S. Pat. No. 5,493,121 to Fitzpatrick

U.S. Pat. No. 6,133,614 to Shoji *et al.*

U.S. Pat. No. 6,448,559 to Saoudi *et al.*

U.S. Pat. No. 6,362,480 to Peter *et al.*

U.S. Pat. No. 6,553,092 to Mattson *et al.*


7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark R. Gaworecki whose telephone number is (571) 272-8540. The examiner can normally be reached on Monday through Friday, 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2884

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MG  
4/4/2006



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